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DEVELOPMENT OF A SCALE TO PREDICT PATTERNS OF COGNITIVE APPRAISAL OF STRESS

A Thesis

Presented to

The Faculty of the Department of Psychology

The College of William and Mary in Virginia

In Partial Fulfillment

Of the Requirements for the Degree of

Master of Arts

---

by

Eileen A. Schmaltz

1973

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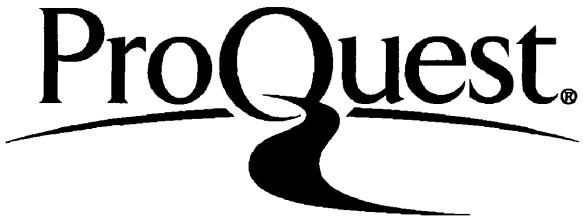

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APPROVAL SHEET

This thesis is submitted in partial fulfillment of

the requirements of the degree of

Master of Arts

Eileen A. Schmaltz

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Abstract

Based on research on perceptual defense, defense mechanisms, emotional labeling, and cognitive appraisal of threat, it was hypothesized that discrepancies between verbal and physiological measures of stress could provide meaningful information concerning underlying cognitive processes. It was further hypothesized that discrepancies would parallel scores on a repression-sensitization (R-S) scale. To test these hypotheses a series of two experiments were run. In study one, 20 Ss were selected from a large S pool of college students on the basis of their extreme scores on Byrne's R-S scale. Subjects were then exposed to vicarious stress by viewing pornographic and homicide slides. Physical stress was also experienced in the form of a mild electric shock. Both physiologic and subjective data was collected from which discrepancy scores for over- and underraters were computed. The R-S scale did not discriminate between over- and underraters and was therefore, rejected as a scale for measuring this tendency. An item analysis of the R-S, EPI, 16 PF, and APQ scales (all previously administered to Ss) yielded 29 items that differentiated over- and underrating Ss. These items were combined with fillers to form a new scale of 100 items, the Self Description Questionnaire(SDQ). Analysis of the data indicates that there is no significant difference between over-and underrating groups in physiological responses, suggesting that the discrepancies are caused by differential patterns of cognitive appraisal of stress.

Study two was run in order to validate the SDQ. There were 56 subjects with extremely high or low scores on the SDQ put through the experimental procedure. It was hypothesized that high scorers would tend to overrate their subjective emotional response to stress while low scorers would tend to underrate their subjective response. Although a trend was evident this hypothesis was not supported. The inability of the SDQ to predict styles of cognitive appraisal of stress is attributed to the differences between the two studies, particularly the difference in stress quality of stimuli. The results are discussed in relation to a cognitive physiological theory of emotion.

DEVELOPMENT OF A SCALE TO PREDICT PATTERNS OF COGNITIVE APPRAISAL OF STRESS

Experiment 1

Introduction

When faced with a stressful situation over which he has no behavioral control (e.g., he can neither escape or avoid the stressor), an individual may resort to cognitive control (Averill, 1972). Use of cognitive control or perceptual defense became evident in perception experiments during the late 1940s (Bruner & Postman, 1947a, 1947b; Postman, Bruner, and McGimies, 1948, quoted from Byrne, 1961), which demonstrated a differential recognition threshold for matched pairs of neutral and emotionally toned stimuli. Results suggest that individuals fall along a continuum with respect to the characteristic way in which they respond to threatening stimuli. At one extreme of this continuum are behavior mechanisms of a predominately avoiding (denying, repressing) type, while at the other extreme are predominately approaching (intellectualizing, obsessional) behaviors. Research utilizing differential recognition thresholds for emotionally-toned versus neutral stimulus material has frequently employed the terms repressor and sensitizer to describe representatives of the respective ends of this dimension. Individuals in the former category are defined as those exhibiting a relatively elevated threshold for emotional material (defense, disruption) and in the latter, as those exhibiting a relatively lowered threshold for such material (vigilance, facilitation) (Byrne, 1964).

In several studies, a relationship was found between differential threshold scores and other behaviors. A summary of this

evidence is available in Byrne's 1961 article and lends credence to the utility of the dimension. This repressor-sensitizer continuum, demonstrated across many situations and response types led to a search for a paper and pencil test to measure this dimension of personality. Various subscales of the Minnesota Multiphasic Personality Inventory (MMPI) were used with varying degrees of success. This search for a reliable scale culminated in the development of the Repression-Sensitization (R-S) scale (Byrne, 1961), which has undergone considerable reliability and validity testing, most of it by Byrne himself.

At this point it would be advantageous for us to consider developments in several other areas of research. In a series of creative but not particularly well controlled experiments, Schachter (Schachter, 1964, and Schachter & Singer, 1962) has demonstrated that cognition is as important as physiological arousal in the recognition and interpretation of emotion. More specifically, he demonstrated that the kind of emotion expressed was more influenced by the social situation and demands than by artificial induction of physiologic arousal. This finding leads Schachter to endorse a cognitive physiological theory of emotion. This theory of emotion suggests that physiological arousal is necessary for an individual to feel emotion, but once aroused, the type of emotion felt and expressed is determined by cognitive factors, which in turn may be influenced by social or personality factors.

Lazarus and his colleagues have also presented evidence that cognitions can alter the stress quality of a threatening situation.

These perceptual defenses operate by "short-circuiting" the threat by cognitive appraisal and reevaluation of the situation (Lazarus, Opton, Nomikos, & Roukin, 1965). In a laboratory setting (Lazarus et al., [1965] and Lazarus & Alfert [1964]) significantly reduced the amount of physiological arousal by providing plausable statements that would encourage "short-circuiting" either by denial or intellectualization of the threat. Experimental provision of defensive material helped alleviate stress, suggesting that a similar process is executed during normal coping processes. Therefore, Lazarus also endorses a cognitive physiological theory of emotion, particularly as it applies to stress reactions (Lazarus & Averill, 1972).

These and other studies of stress reactions have reported a lack of agreement between physiological and verbal data. Recently these discrepancies have been reexamined as a source of additional information concerning the underlying psychodynamic processes. It is suggested that the cognitive defenses measured by the R-S continuum are involved in changing the amount of threat expressed verbally and would therefore account for at least some of the discrepancies between verbal and physiological responses to stress. In a reanalysis of six experiments, Weinstein, Averill, Opton, and Lazarus (1968) hypothesized and demonstrated that Ss labeled "repressors" showed relatively greater autonomic than self-report reactions to stress while "sensitizers" tended to exhibit the opposite pattern. Dividing their Ss into three groups on the basis of discrepancies between physiological and verbal reports, Houston and Hodges (1970), found that

cognitive appraisal or "short-circuiting" could affect performance. Deniers performed consistently better than sensitizers with a neutral group falling in between them.

Summarizing the evidence presented above: There does seem to be a valid continuum of behavior, the extremes of which may be termed "sensitizing" and "repressing." The R-S scale developed by Byrne (1964) purports to measure this dimension; there is some empirical support to suggest that it does. Extension of the logic behind the R-S scale would suggest that sensitizers and repressors label their physiological reactions differently (Schachter, 1964). Labeling or appraisal, tends to "short-circuit" or alleviate stress (Lazarus, 1964). This cognitive appraisal in turn may lead to discrepancies between verbal and physiological indicants of stress such that repressors tend to underrate in their self-report (as compared to the physiological measures) and sensitizers tend to overrate their emotion reaction.

Thus the following hypotheses were formulated:

a. Personality factors can influence the type of cognition that determines the coping or defensive style used by a stressed individual.

b. This defensive style may be studied by analyzing the discrepancies between verbal report and physiologic indicators of stress.

c. People underrating their reaction utilize denial, avoidance responses. Those who overrate their reactions use

intellectualizing defenses.

d. This description of under and overraters appears to parallel that of repressors and sensitizers and suggests that an R-S scale would measure the coping strategy used.

e. Byrne's (1964) R-S scale, should then be able to predict the direction of discrepancies exhibited in the lab.

This study was designed to test these hypotheses and attempted to correct some of the weaknesses evident in previous research. First, it was designed specifically for this purpose and was not a post facto look at data collected for other reasons. Second, the R-S scale, the most refined of the available scales, was used as the S selecting factor. Since cognition is an ongoing process, more than one verbal and one physiological measure were recorded and used to derive the discrepancy scores. In case the R-S scale did not predict over-and underraters by this revised operational definition, other personality inventories were administered to provide a pool of items that could be used to develop a new scale. Since there is some uncertainty about the stress quality of the stimulus materials, all Ss were threatened with and given a mild electric shock. Hence, comparison of subjective and physical stress could be made.

Other personality tests given were Eysenck's Personality Inventory (EPI), the Autonomic Perception Questionnaire (APQ) (G. Mandler, J. Mandler, & Uviller, 1958), and the 16 personality factor (16 PF).

Method

Subjects. The R-S scale was administered to 134 female and male undergraduates. Ss scoring below the 20th percentile or above the 80th percentile, were termed "repressors" and "sensitizers", respectively. Because fewer males returned the questionnaire (54 as compared to 80 females) there were 11 males in each category as compared to 16 females. From this pool, five male and five female repressors and sensitizers were selected for a total of 20 subjects. The mean scores for repressors and sensitizers were 39 and 94, respectively. These subjects were contacted by phone, at which time the nature of the experiment was explained. Ss were also informed that they would be paid for their time. All Ss agreed to participate.

Apparatus. Heart rate (HR), galvanic skin response (GSR), finger pulse volume (FPV), and respiration rate (RR), were simultaneously recorded on an E&M Instruments Model 6 Physiograph. Respiration was recorded from a bellows pneumograph placed approximately 8 inches below the arm pit. Standard GSR electrodes were attached to the first and third finger of the right hand. Electrodes were coated with Sanborn Redux electrode paste prior to placement. Finger pulse volume was recorded from an E&M photocell plethysmograph placed on the second finger of the right hand. Heart rate was triggered from the finger pulse volume. Shock was administered through zinc coated EKG plate electrodes attached to the Ss right forearm. All Ss were tested individually and were seated in a dental chair inside a 7 x 7 x 7 foot aluminum screen cubicle that

electrically isolated them from the surrounding room.

Slides. The homicide slides were selected from a larger pool used by Hare, Wood, Britain, and Shadman (1971). They were obtained from unretouched police files and consisted of both on the scene and morgue shots. The slides with sexual content were the same as used by Dr. John Money at Johns Hopkins University. Dr. Money had previously used the slides for sex education classes for first year medical students and undergraduates and even for Parent-Teacher Association (PTA) groups. He states that viewers adapt to the slide content very quickly. No adverse effects are reported for either type of slides. The sexual slides were further divided into three categories of 16 slides each. The categories were:

a. Nudes (eight female and eight male),

b. heterosexual activity (eight conventional and eight unconventional scenes), and

c. a rather loose category of erotic art and bestiality (eight each).

These plus 16 homicide slides (eight on the scene, and eight morgue shots) made up the 64 slides shown initially, in random order, to each subject. Later in the procedure, five neutral slides of Colonial Williamsburg were introduced. Slides were projected on a screen approximately 6 feet from the S by a Kodak Carousel projector. Viewing size was approximately 30 inches x 40 inches. Ss rated their perceived emotional reaction to the slides on a 7-point Lykert type scale where 1 denoted no reaction, and 7 meant a large one.

Procedure. Ss were seated in the dental chair and made comfortable. They were shown all 64 slides at a two second presentation rate. After each slide was shown they wrote their emotional reaction to it using the 7-point scale. Subjects were informed that they could terminate the experiment at any time and still receive payment and that the experimenters reserved the right to do so also, if they deemed it necessary. After the subjects had seen all of the slides this briefly, they were asked if they would object to seeing the slides again for a longer time--10 seconds. If there were any particular slides that Ss did not wish to see, those slides were omitted from the list. Only four Ss refused to see particular slides, all of which were homicide slides. The number ranged from one or two- to all-16 (one case). All Ss agreed to continue the experiment. At this point the Ss were shown a sample landscape slide which was representative of the neutral slides. Ss also agreed to be given an electric shock in their arm. The harmless DC shock was fully explained and Ss were allowed to select their own level of intensity. The level was determined by setting the shock intensity below threshold and increasing it in a stepwise fashion until the S told E to stop. Ss were asked to select a level which they found aversive but could tolerate for 5- to 10-second intervals. Ss were told that the actual intensity level did not matter and that it was not a test of the amount of shock that they could stand. They were also informed that the intensity level would not be changed but that if it subjectively became worse, that it could be readjusted at any time during the

experimental procedure. Ss were then attached to the other physiological recording equipment. The room was darkened and they were told to relax for 10 minutes so that a baseline measure of their physiological responses could be obtained. During this time the E selected the five most stressful slides (that the S agreed to see) from each category. Since each S chose his own slides, the E had no control over which slides within each category were actually seen. This control was relinquished in favor of getting subjectively equal slides as far as stress value was concerned. The initial procedure also allowed the Ss to view all of the potential slides and decline to see some of them if he found them too upsetting. It also gave him the opportunity to leave the experiment before the demand characteristics became too high.

The presentation was in a predetermined random order (20 stressful and five neutral slides plus five trials of shock), with the restriction that the first and last slides be neutral (Hare, 1971) and that two slides from the same category were not presented successively. Each slide or shock was presented for 10 seconds followed by a 20- to 25-second intertrial interval. During this time Ss again rated their emotional reaction to the slide on the 7-point scale. Ss were cautioned not to try to recall how they had rated the slide or shock previously but to rate how they felt at this presentation. The rating and category of the slide was recorded by the Es. A female E was present at all times and a male E was present most of the time.

After all 30 trials the equipment was removed from the Ss. They were shown their physiological record which was explained carefully. They were encouraged to ask questions and make comments. During the postexperimental interview the Es sought to determine if there were any adverse effects from the experiment. Counseling services were offered by the male E to all Ss and encouraged for those who seemed more upset. Ss were then asked to complete the EPI and the 16 PF. Because the APQ was unavailable until after all Ss had been run, Ss were contacted by mail and asked to complete it and return it at their convenience. Since this test was administered differently, the scores from it will not be completely valid or comparable to the others.

Results

Pearson correlations were performed on all of the personality scales. The significant correlations are presented in Table 1. The table suppresses the intercorrelations of the separate 16 PF subscales. Despite the fact that these scales are supposed to be independent, there were seven significant correlations; probably due to the biased sample. The high correlations of the R-S scale with extraversion (r = -.673) and neuroticism (r = .718) confirm Dana and Cocking (1966) and Byrne, Golightty, and Sheffield (1965) findings that sensitizers tend to be introverted and neurotic as compared to repressors. The significant correlation (r = -.640) with the C scale

TABLE 1

Table of Significant Pearson Correlations on Eysenck's Personality Inventory, 16 Personality Factor and the Repression-Sensitization Personality Tests.

Test	Scale	Eysenck Scales E	N	L	R-S
Eysenck Personality Inventory	E		-.664**		-.673**
	N	-.664**			.718***
	L				
16 Personality Factors	A				
	B				
	C	.579**	-.546*		-.640**
	E				
	F	.675**			-.528*
	G				
	H	.580**	-.624**		-.594**
	I	-.495*			
	L				
	Q4	-.447	.690***		-.693***
	MD		-.577**		-.488*

*p<.05, **p<.01, ***p<.001

from the 16 PF, which measures emotional stability or ego strength, suggests that repressors are more stable and have higher ego strength than sensitizers. The R-S dimension is also significantly related to the F, H, Q4, and MD scales of the 16 PF; these data suggest that repressors are more happy-go-lucky (F), are more venturesome and uninhibited (H), are more tense and frustrated (Q4), and tend to respond in a more socially desirable manner (MD) relative to sensitizers. As the Ss were selected on the basis of their extreme scores on the R-S scales making this a noncontinuous variable, Point Biserial correlations of the R-S scale with the other scales were computed, yielding the same results as the Pearson correlations.

Shock intensity levels selected were analyzed, showing no difference in levels chosen by repressors or sensitizers ($t = 1.40$, $df = 18$) with repressors tending to select higher shock levels. The 10 seconds when each slide was visible was considered the stimulus interval. The 10 seconds immediately preceding slide presentation, the prestimulus interval, was used to adjust for individual differences in initial levels of response. The methods used for quantification are described below. Heart rate was scored for the fastest (HR-MAX) and slowest (HR-MIN) beats in both intervals. These scores were subtracted and this difference score was used as the heart rate change measure (HR-V). The lowest GSR resistance level

was determined for each interval, converted first to conductance and then to logarithms. The log of the prestimulus interval was subtracted from the log of the stimulus interval. Mean FPV was computed by averaging the length of every third finger pulse wave. The mean of the stimulus was divided by the mean of the prestimulus and the quotient subtracted from 100, yielding a percentage of change score. Any responses that were dilated (indicating relaxation rather than stress) were scored as zero. The number of respirations was simply counted for prestimulus and stimulus intervals. Approximately the same measures were taken for the first and last 20 seconds of the adaptation period. A fidget index was obtained by counting the number of movement artifacts in the FPV record. t tests revealed that there was a significant ($t = 2.2$, $df = 18$, $p < .05$) difference between repressors and sensitizers, with sensitizers fidgeting more. There was also a significant difference ($t = 2.73$, $df = 18$, $p < .05$) between prestimulus and stimulus intervals with more movement during the slide presentation.

Scores transformed as described above from GSR, FPV, HR-MIN, HR-MAX, HR-V, and self-reports were analyzed in a 2 (repressor-sensitizer) x 2 (male-female) x 6 (slide categories) split plot factorial analysis of variance with repeated measures on the last factor. Data from the five slides in each of the six categories were

averaged together for this analysis. The analysis of variance summary table for the ratings data is presented in Table 2. There are significant (F = 26.01, df = 5/80, $p < .001$) differences in categories of stimuli. The summary tables for the physiological data are not presented but means for all measures are presented in Table 3. There are significant differences between stimulus categories for all modalities (HR-MIN F = 5.2, $p < .001$, HR-MAX F = 4.11, $p < .01$, FPV F = 4.9, $p < .001$, GSR F = 60.58, $p < .001$, df = 5/80 for all variables) except for the HR-V modality (F = .424, df = 5/80, NS). A Newman-Keuls Multiple comparison test showed that for both physiological data and emotional ratings data there were significant differences between the landscape category and all others, which were all rated or reacted to more strongly than the landscapes. This is presented graphically for the ratings data in Figure 1. There were no significant differences between groups for any of the five modalities measured. Females rated significantly (F = 6.35, df = 5/80, $p < .001$) higher than males, but there were no significant sex differences in the physiological data.

For each S 120 discrepancy scores were computed, 30 for each of four modalities. Transformed scores for all slides and all Ss were converted to standard scores within each variable. Then the GSR,

TABLE 2

Analysis of Variance:

Emotional Ratings Data

Source	df	MS	F
Groups (A)	1	0.21	n.s.
Sex (C)	1	21.34	6.35**
A x C	1	1.98	n.s
Error $_{between}$	16	3.36	
Categories (B)	5	17.04	26.01***
A x B	5	0.38	n.s
B x C	5	1.37	n.s
A x B x C	5	0.32	n.s.
Error$_{within}$	80	0.66	

**$p < .01$
***$p < .001$

TABLE 3

Means for Physiological Response Modalities

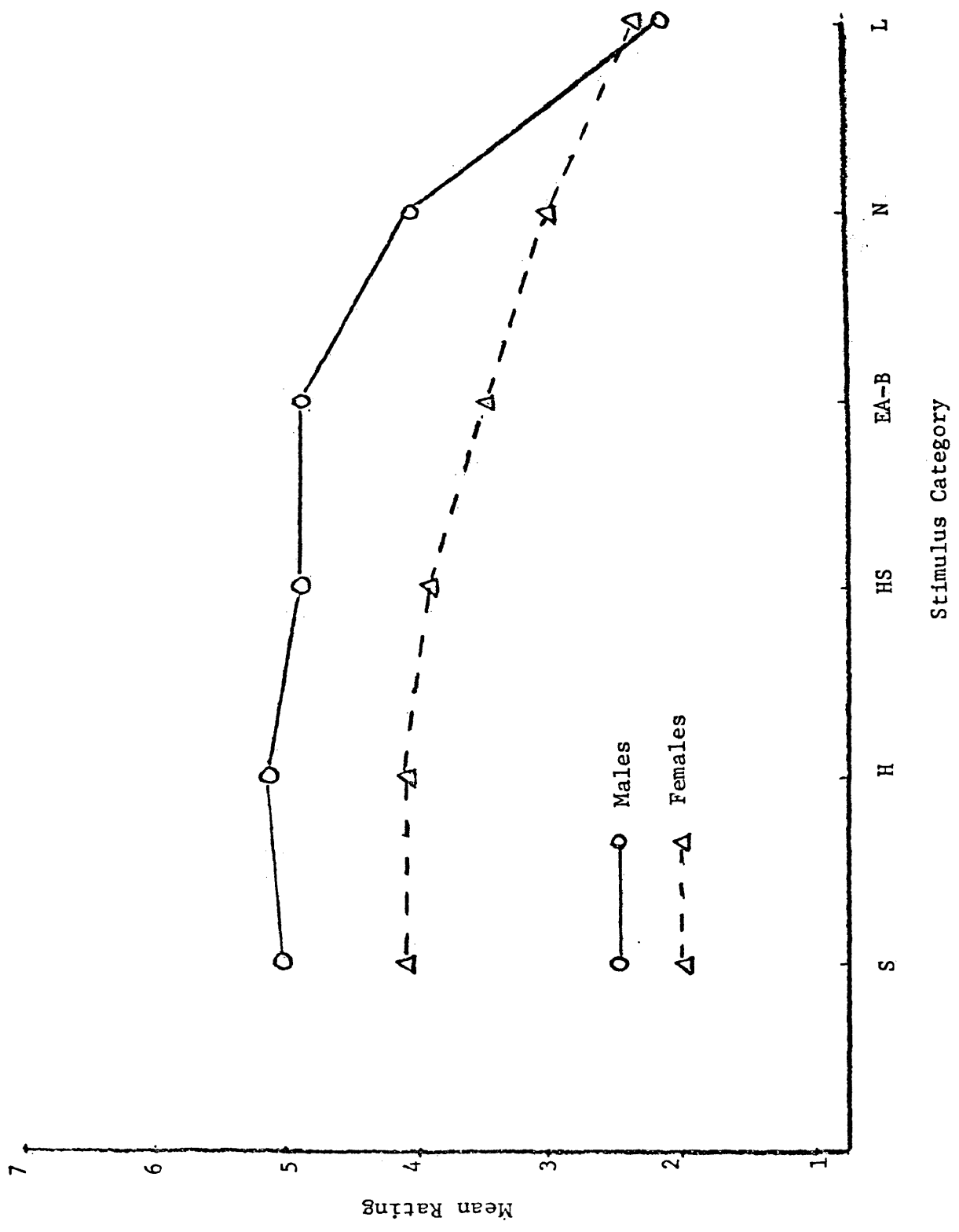
Response Modality	Group	Stimulus Category S	H	HS	EA-B	N	L
HR-MIN	Repressor Male	64.40	62.64	63.64	62.00	62.60	62.72
	Repressor Female	71.40	71.88	69.84	70.68	69.72	73.04
	Sensitizer Male	70.68	69.00	66.96	66.96	65.56	68.28
	Sensitizer Female	69.52	66.96	63.48	64.68	63.20	64.28
HR-MAX	Repressor Male	77.92	82.00	79.92	78.16	78.00	79.96
	Repressor Female	89.68	88.96	86.68	85.40	85.64	87.64
	Sensitizer Male	89.48	85.16	86.64	83.48	84.68	85.80
	Sensitizer Female	88.4	84.00	80.48	83.60	84.32	84.12

TABLE 3 Continued

Response Modality	Group	Stimulus Category S	H	HS	EA-B	N	L
FPV	Repressor Male	14.12	4.60	7.84	6.76	10.16	8.48
	Repressor Female	26.84	15.40	19.08	14.56	11.32	18.32
	Sensitizer Male	13.56	10.32	13.48	18.00	14.40	15.32
	Sensitizer Female	24.04	9.68	11.80	13.60	12.44	14.84
GSR	Repressor Male	0.075	0.022	0.032	0.023	0.016	0.029
	Repressor Female	0.071	0.007	0.019	0.012	0.025	0.012
	Sensitizer Male	0.080	0.014	0.021	0.016	0.010	0.018
	Sensitizer Female	0.091	0.014	0.026	0.024	0.015	0.026

Note.-Sis shock, H is homicide vicitms, HS is heterosexual activity, EA-B is erotic art and beastiality, N is nudes, L is landscapes.

Figure 1. The interaction of stimulus categories and sex (B x C) for the ratings data.


Mean Rating
7
6
5
4
3
2
1
S
H
HS
EA-B
N
L
Stimulus Category
Males
Females

FPV, HR-MAX, HR-MIN standard scores were separately subtracted from the standardized rating score. These different scores constituted the discrepancy scores. An S's discrepancy score was positive (+) if his Z score emotional rating was greater than his autonomic response Z score. Positive scores are indicative of the S's rating his emotional response as greater than autonomic measures indicated and are thus referred to as overratings. Negative (-) scores are obtained when S's emotional ratings Z scores are less than the autonomic Z scores, and are referred to as underratings. Subjects were categorized as either overraters or underraters if at least 21/30 ($p < .05$) of their discrepancy scores for one response modality were either positive or negative and if they exhibited a stable response pattern across all autonomic modalities. This criteria was met by eight overraters and seven underraters. The other five subjects did not qualify, usually because their pattern of discrepant scores was inconsistent across autonomic measures. Because there were representatives from each of the four original groups, the data was reanalyzed using the new groups (e.g., female and male, over- and underraters across all six categories). As there was such a large difference in cell size (5, 3, 1, 6), the results of a three factor analysis, although significant, were discarded as invalid. A two factor (over- versus underraters x six categories) split plot factorial analysis of variance with repeated measures on the last factor was substituted. Again all variables produced significant differences in categories. Results of

a Newman Keuls multiple comparison test show that landscape slides are less arousing than slides in other categories. The only difference between groups was with the subjective ratings ($F = 11.87$, $p < .01$, $df = 1, 13$, $rm = .64$) with overraters rating more emotional reaction than underraters, illustrated in Figure 2. Figures 3 and 4 portray typical under- and overraters, respectively. These figures were made by averaging the Z scores for the five slides within a category for both ratings and HR response, thus depicting data leading to the discrepancy scores. Notice that the subjective rating Z scores are lower than the HR Z scores for the underrater and that there is an opposite pattern for the overrater. This pattern is evident for all stimulus categories except landscapes.

An item analysis was completed on all of the items from the personality tests given, that is, the 16 PF, EPI, APQ, and R-S. The criterion for analysis was that an item must differentiate between overraters and underraters as defined above. There were 15 items which significantly differentiated over- and underraters at the $p < .05$ or better and 13 more were significant at $p < .10$. Also, eight of the items were from the 16 PF, three from EPI, nine from the R-S and eight from the APQ. From these items a new personality inventory, the Self Description Questionnaire (SDQ), was created. In order to keep the testing situation as similar to the original one as possible, filler items were randomly selected from the "parent" tests so that the new scale consists of 100 items. The scale is divided into three sections on the basis of format of the questions. The

Figure 2. Mean subjective emotional rating for under and overraters across all stimulus conditions.

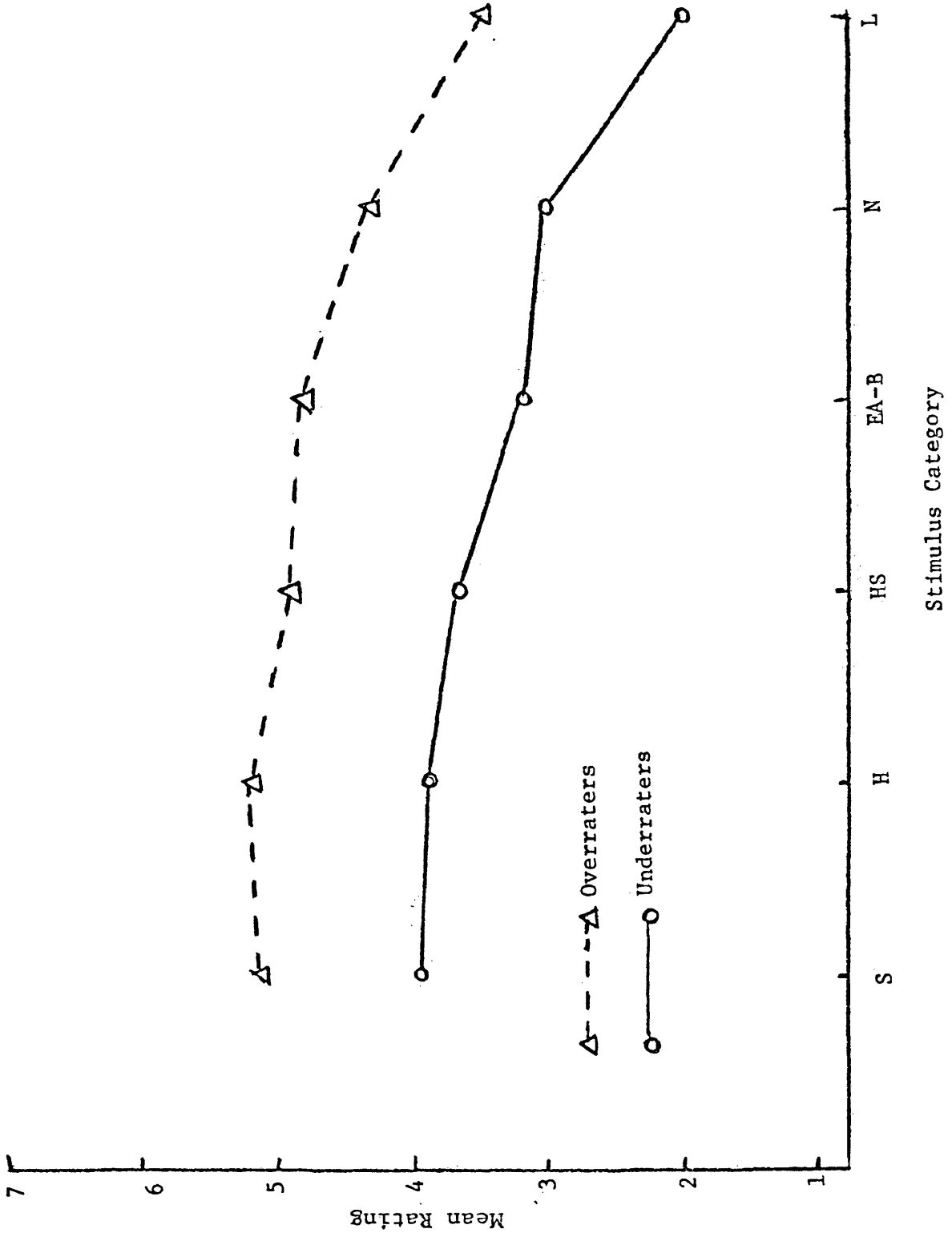

Mean Rating
7
6
5
4
3
2
1
S
H
HS
EA-B
N
L
Stimulus Category
Overraters
Underraters

Figure 3. Comparison of average z scores of heart rate response to average z scores for emotional reaction for subject 11, an underrater.

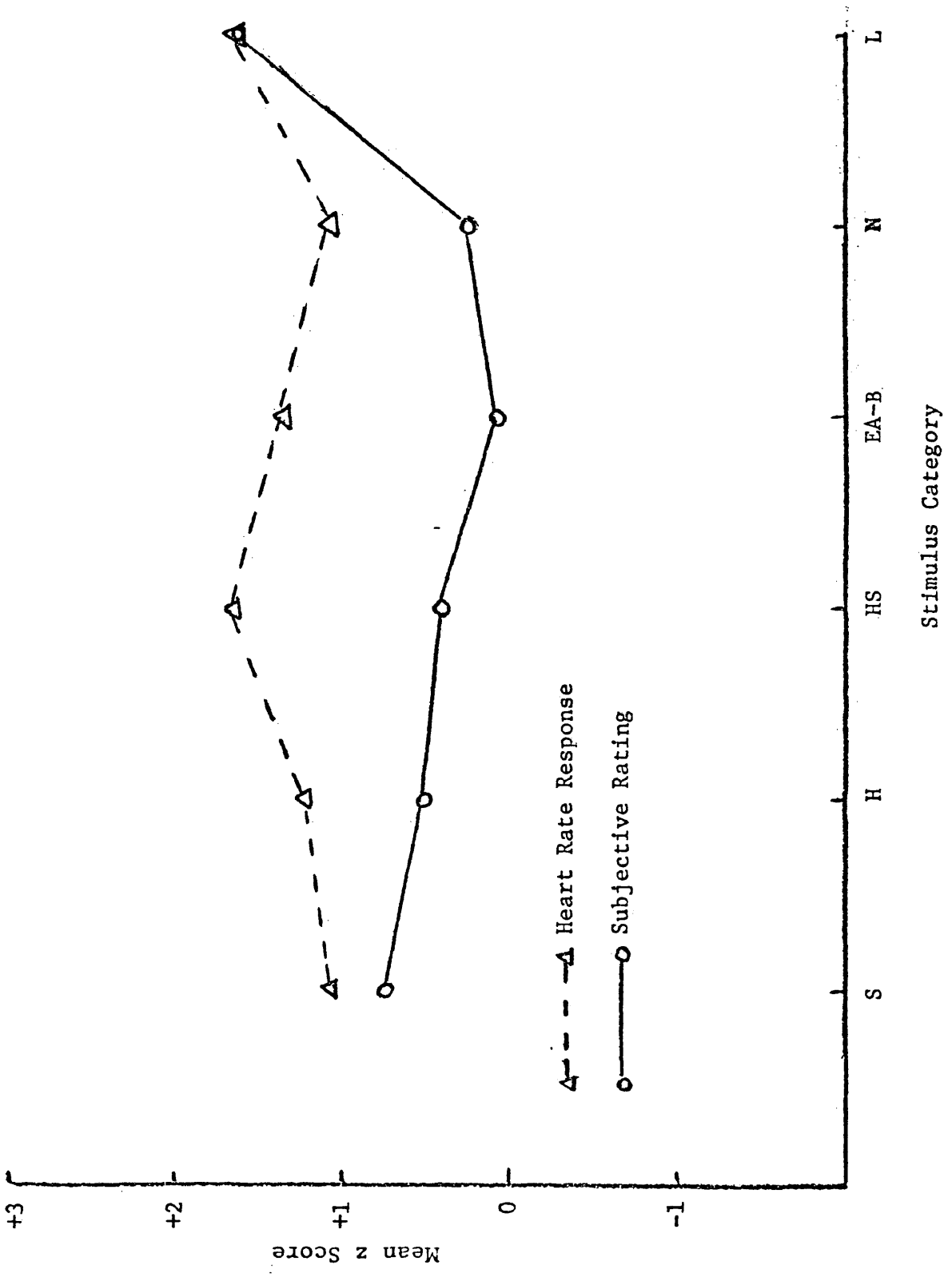
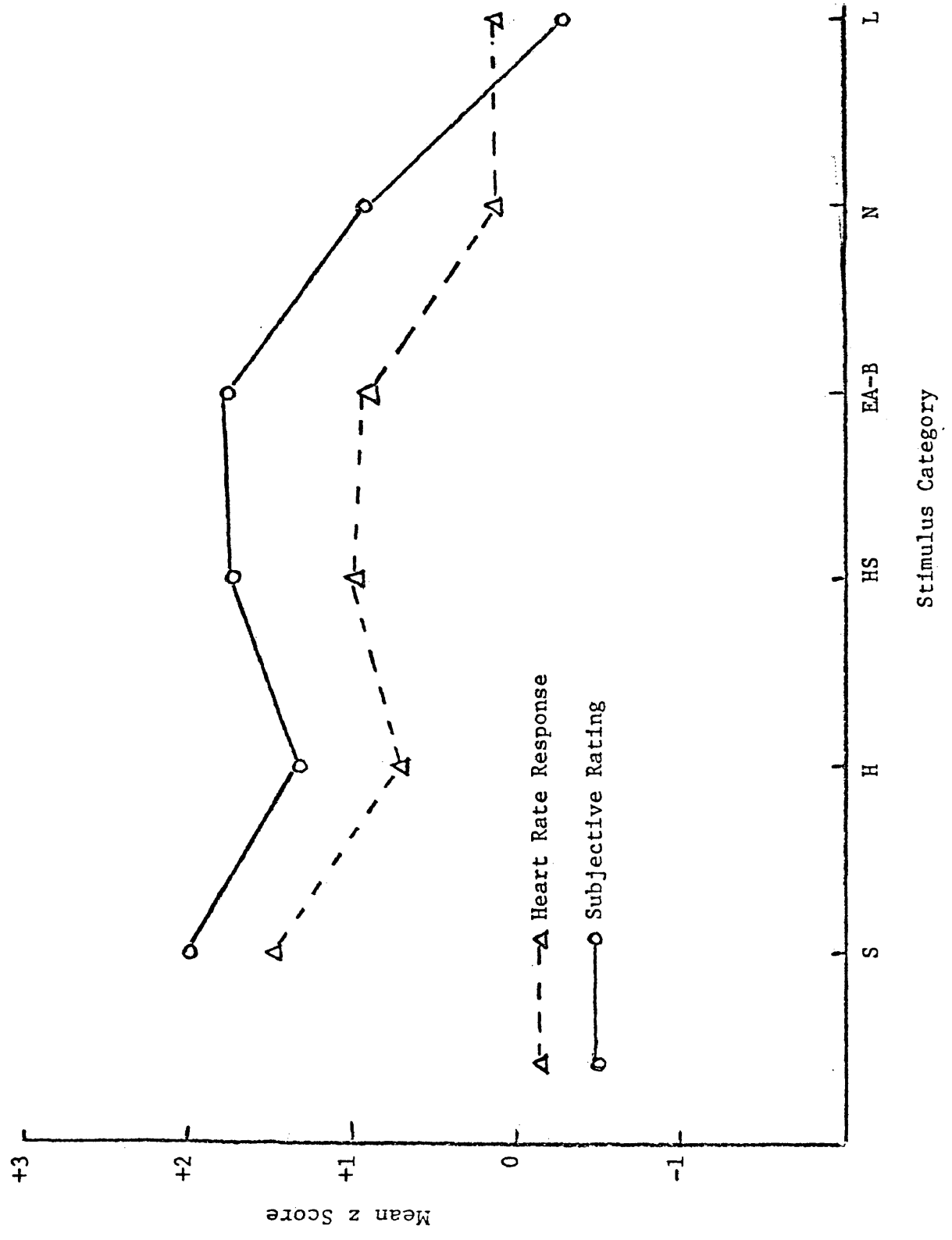

+3
+2
+1
0
-1
Mean z Score
S
H
HS
EA-B
N
L
Stimulus Category
Heart Rate Response
Subjective Rating

Figure 4. Sample comparing the subjective rating and heart rate response for a typical overrater.


Mean z Score
+3
+2
+1
0
-1
S
H
HS
EA-B
N
L
Stimulus Category
Heart Rate Response
Subjective Rating

first section, True-False, contains items and fillers from the EPI, R-S scale and paranoid questions. Since paranoids claim to have excessive control over their emotions and would, therefore, deny or underrate them (Shean & Schmaltz, 1973), questions defining classic paranoid symptoms were included. EPI questions were not originally in a True-False format, but there were so few items (three with six fillers) that a separate section would have been obvious. The second section consists of items taken from the 16 PF and are of the "yes," "sometimes," "no" variety. The third section is a modified version of the APQ. All of the questions were included because of their unusual format and because of the fact that eight of the 21 anxiety questions significantly differentiated over- and underrating Ss. The complete SDQ is presented in the Appendix.

Discussion

Although the R-S scale was expected to measure over- and underraters of emotional arousal, this was not the case. The only differences apparent from statistical analysis of repression-sensitization groups were between slide categories. Sex differences approached significance in most of the modalities, but not one differentiated between repressors and sensitizers. This failure of the R-S scale to indicate over- or underraters may be interpreted in two ways. First, the scale may really work but only with more extreme scorers than could be selected from the perhaps too homogeneous population of undergraduates taking introductory psychology. The second view is that the scale really does not predict over- or underraters of

emotional response. If this is the case, it may be that the scale does not adequately measure repressors and sensitizers, that repressors do not underrate and sensitizers do not overrate as is suggested by the theory, or that over-or underrating of emotions is not stable across situations and, therefore, would not be evident in a written test. Further research is necessary before this matter can be settled satisfactorily.

Reanalysis of the data grouped by actual discrepancy scores reveals no difference in physiological arousal but substantial differences in subjective ratings. It seems clear that the discrepancies reflect different interpretations of the physiological information. This interpretation or reevaluation, may reflect different defense modes--either denial of arousal, intellectualization, or perhaps other variables as yet undefined.

The results of this study lend support to a cognitive physiological theory of emotion. When the stimulus is relatively neutral, as with the landscape slides, there is little physiological arousal and little need for defense. Thus emotional ratings are relatively good predictors of physiological response. However, as arousal increases, as with the homicide and sexual slides, there is more need for cognitive appraisal and reevaluation. This is reflected by the discrepancies between groups in their characteristic mode of defense: Overraters give subjective appraisals of their response that are higher than their physiological responses, while underraters report less emotional arousal than their physiological record shows. The

important point is that Ss are subjectively discriminating between stressful and neutral stimuli.

Experiment 2

Introduction

In order to validate the scale developed in study 1, the experimental procedure was administered to high and low scorers on the SDQ to see if they would be over- or underraters. Specifically, it was predicted that high scorers on the SDQ would overrate their subjective response to emotionally stressful stimuli as compared to their physiological response, and that low scorers would underrate their subjective response as compared to their physiological response to stressful stimuli. Some changes in procedure were necessary. As it is difficult to validate a scale based on only a few subjects, the first change was to increase the number of subjects. Since the only differences between over- and underraters in study 1 were verbal ratings rather than physiological responses, it was decided that it was unnecessary and uneconomical to collect physiological data from all Ss. Physiological data was recorded from some Ss in order to compare it to study 1 and to be sure that the subject populations were approximately the same. Ss were run in groups of three and although electrodes were connected to all Ss and all Ss thought that their physiological responses were being recorded, only responses from one S in each group of three were actually recorded. This procedure necessitated the elimination of the initial viewing of a large pool of slides for selection of stressful stimuli by each S. As the Ss in study 1 tended to choose approximately the same slides, and as no problems were evidenced by any subjects, it was

felt that this would not seriously alter the experimental conditions. The number of stimulus presentations was reduced from 30 to 20. Since shock proved to be comparable in stress quality to homicide slides and also because of the difficulty of administration, electric shock was eliminated from the procedure. The writer chose the stimulus slides from the pool used in study 1 and arranged them in a predetermined random order. Because the opportunity to refuse to see any of the slides after a brief initial view was not given to the Ss, the slides chosen for study 2 were judged less stressful (as determined by the writer and several graduate students who previewed and rated the slides) than the ones used in study 1. These were the only changes made and many were first used in a related study (Shean & Schmaltz, 1973).

Method

Subjects. The SDQ was administered to two introductory psychology classes and completed forms were returned by 158 students. These forms were scored for under- and overraters based on the items that successfully differentiated Ss in experiment 1 (29 items). Ss scoring below the 25th percentile or above the 80th percentile were termed low and high scorers, respectively. Because fewer males returned the questionnaire (70 as compared to 88 females) there were 17 males in each category as compared to 22 females. The mean score for the SDQ for males was 13.4 with a standard deviation of 3.03. The mean for females was 14.7 with a standard deviation of 2.82. This difference was significant ($t = 2.84$, $df = 156$, $p < .01$) but small

(rm = .23). There were 56 Ss actually used; 15 high scoring males with a mean score of 17.74, 12 low scoring males with a mean of 10.33, 15 high females with a mean of 18.69 and 14 low scoring females with a mean score of 11.21. Of these Ss, physiological data was recorded on 10 males--six high and four low scorers, and 11 females--six high and five low scorers.

Apparatus. The apparatus used is the same as described in Experiment 1 with the following exceptions: Ss were run three at a time except for six subjects run in pairs because three subjects failed to show up for the experiment. They were seated in the same room, separated visually by partitions and wore ear phones to partially block out auditory communication. Wires from the electrodes placed on the Ss were run through a hole in the wall to an adjacent room where the physiological and timing equipment was kept. The Ss were separated from this equipment for two reasons. First, neither room was large enough to physically accommodate the Ss and equipment comfortably. Second, it was necessary to maintain the fiction that physiological data was being recorded on all Ss. Instructions were presented auditorily through the earphones by a Wollensack tape recorder. The voice was that of the female E. The slide projector was in the subject room and slides were projected directly on the wall approximately 6 feet from the Ss.

The only physiological data collected was FPV, GSR, and HR. HR was recorded from zinc coated EKG plate electrodes attached to the lower forearms, thus keeping the number and placement of electrodes

approximately the same in both studies (the shock electrodes were eliminated). The erotic art and bestiality slide category of study 1 was cut and the nude category divided into separate categories for males and females. Thus, the five stimulus categories presented were homicide victims (H), heterosexual activity (HS), male nudes (MN), female nudes (FN), and landscapes (L). Four slides were used in each category making a total of 20 slide presentations. Ss again rated the magnitude of their emotional response on the 7-point Lykert type scale. Ss were required to write the rating because verbal announcements might influence the other subjects present. In order to avoid an end effect the rating sheet was composed of 25 possible ratings rather than 20. The numbers 1 to 7 were printed on the sheet eliminating as much movement as possible that might bias the physiological record. Instructions were recorded on a Wollensack tape recorder and presented through earphones making their presence useful and a less conspicuous attempt to block out noise.

Procedure. Ss were contacted by Experimenter A who was not involved with the rest of the experiment. At the appointed time Ss were greeted by a male and female E, who introduced themselves and showed Ss where to leave their things. Ss were then shown the polygraph and equipment room and told that their physiological responses would be recorded there. The separation of Ss and equipment was explained on the basis of space limitations only. Ss were then seated

in the subject room in the order indicated by Experimenter A. Both the female and male Es running the experiment were blind to which condition Ss were in, thus assuring equal treatment of all Ss. Electrodes to measure heart rate (HR), finger pulse volume (FPV), and skin conductance (GSR), were attached to all Ss who were then left to become accustomed to the experimental setting. During this period the physiological equipment was calibrated and baseline data was collected. The adaption period was complete when the physiological responses stabilized, approximately 10- to 15-minutes. At this time both Es reentered the subject room. The earphones were placed on Ss heads and they were given rating sheets and pencils. Ss were cautioned not to move as it caused artifacts in the sensitive physiological equipment. Ss were also instructed not to communicate with each other. One E remained in the room with Ss to answer questions, manually operate the slide projector as necessary, and to stop the experiment if requested. The other E monitored the physiological equipment. The first 12 Ss were run with a female E with the Ss and the rest were run with a male E present. This change was made after it became evident that the male E was not experienced enough to handle the physiological equipment. Also, the female E was satisfied that Ss were not becoming overly upset and she felt that there would probably be no crises that would need more experienced handling.

The Ss listened to the instructions and were given an

opportunity to ask questions. There were 20 slides presented, each visible for 10 seconds. After each slide went off Ss indicated their emotional reaction on the 1 (no reaction) to 7 (an extreme reaction) scale provided. The interslide interval varied from 15 seconds to as much as one minute. This interval was controlled by the equipment E who pushed the start button when the physiological responses stabilized.

After this procedure the second E reentered the subject room. The electrodes were removed and any questions were answered. A sample physiological record was shown and explained. Mailing addresses were recorded so that complete results could be mailed to Ss when the analysis was complete. During this postexperimental interview, care was taken to discover how upset Ss had become. Counseling aid was offered and made easy to procure. No Ss reported being upset by the slides and several even said that they were bored.

The only deception was the fact that not all Ss had physiological responses recorded. Although Ss were asked not to discuss the experiment, and it was run over a short time (3 weeks), this information was too crucial for the success of the experiment to risk it becoming known. This last deception was resolved when, several months after the study was completed, the results were mailed to Ss along with a copy of the SDQ which they were to complete. The test was readministered in order to supply test-retest reliability scores.

Results

The Self Description Questionnaire (SDQ) was scored on four subscales.

a. Personality items that successfully differentiated over- from underrating subjects in Experiment 1.

b. Items that were created by the Experimenter based on face validity of items from "a" and on the relation of underrating to paranoid tendencies (Shean & Schmaltz, 1973).

c. Items from the Autonomic Perception Questionnaire (APQ) that differentiated over- and underraters in Experiment 1.

d. All items from the APQ scored for awareness of autonomic activity.

Subscales (A & C) were combined and used to select subjects for Experiment 2. All of these scales were intercorrelated and were correlated with the ratings for each slide category. A summary of the significant correlations presented in Table 4 indicates that none of the subscales satisfactorily predicts overall rating patterns, but that the ratings of heterosexual and especially homicide slides, presumably the most stressful categories, are predicted by the A & C subscale.

Test-retest reliability scores were obtained by administering the SDQ a second time, 6 months after the first time. Pearson correlations were computed on the scores of the 33 subjects who completed the test both times. When all subjects were considered together, regardless of their label of high or low scorers, the correlations

TABLE 4

Intercorrelation Matrix Comparing the Subscales of the Self Description Questionnaire to the Ratings of all Categories

	Subscales					Categories				
Subscales	A	B	C	D	A+C	H	HS	MN	FN	L
A		.375 ***	.273 *		.888 ****	.362 ***				
B					.319 **	.305 **				
C					.684 ****					
D							.351 ***			
A+C						.376 ***	.286 *			
Categories										
H							.575 ****	.270 *		.359 ***
HS								.718 ****	.586 ****	.457 ****
MN									.456 ****	.377 ***
FN										.399 ***
L										

*p < .05
**p < .02
***p < .01
****p < .001

are .525, .634, -.150, .548, and .515 for subscales A, B, C, D, and A + C, respectively. Reliability scores were also computed on the high and low scorers (on the first test) separately. The resulting correlations for the A + C subscales only were -.130 for high scorers and .258 for low scorers. The most reliable subscales were B (questions that the author created) with reliabilities between .50 and .65, and subscale D (the APQ scored for awareness of autonomic response) with reliability scores between .52 and .69.

The ratings data were analyzed for all Ss and again after eliminating data collected from the 12 Ss who were run with a female E present. There were no significant differences due to sex of E and hereafter that factor is ignored.

Both physiological and subjective data were analyzed by two groups (high versus low scorers on the SDQ) x 2 (sexes) x 5 (slide categories) split plot factorial analysis of variance. The ratings data were analyzed first for all 56 subjects and then for the 21 subjects on whom physiological data was collected. As expected, the results were similar, indicating that Ss with physiological data (AnSs) were representative of the entire subject group. There were no significant differences between groups or sexes for subjective ratings. There was a significant difference between slide categories for all 56 Ss ($F = 59.74$, $df = 4/208$, $p < .001$) and for the AnSs ($F = 18.36$, $df = 4/68$, $p < .001$). There was also a significant Sex X Category interaction ($F = 7.773$, $df = 4/208$, $p < .001$, $N = 56$; $F = 3.97$, $df = 4/68$, $p < .01$, $N = 21$). The complete results of the

analysis are presently in Tables 5 and 6 and are presently graphically in Figure 5. Although the analysis of variance yielded no significant difference in emotional ratings between high and low scorers on the SDQ, it approaches significance ($F = 3.72$, $df = 1/52$, $p < .10$) and inspection of Figure 5 reveals that the mean emotional rating was greater for high than low scorers in all categories except landscapes. For these reasons and because of the great variability, a nonparametric statistic, Chi Square, was used showing that the mean emotional rating of the high scorers was significantly higher than the mean of the low scorers ($X^2 = 4.9$, $df = 1$, $p < .05$).

Results of Tukey's HSD test for multiple comparisons of the category differences reveals that homicide slides are significantly more emotionally arousing than all but the heterosexual category. Heterosexual ratings were significantly higher than landscapes and male nudes only. Female nudes were rated higher than landscapes. Because of the complexity of the Sex X Category interaction, the complete results of the multiple comparison test are presented in Table 7. Only the most theoretically relevant differences will be discussed in the text. As can be seen in Figure 6, although males and females rated the landscapes similarly, there were large differences in their rating of homicide and heterosexual slides with females rating higher in both categories. Another interesting aspect of the interaction effect is the way same and opposite sex nude slides were rated. Females rated both categories about the same. Males, however, found female nudes much more emotionally arousing than male nudes.

TABLE 5

Analysis of Variance:

Emotional Ratings Data

Source	df	MS	F
Sex (A)	1	0.02	n.s.
Score (B)	1	11.76	3.72*
A x C	1	1.53	n.s.
Error $_{between}$	52	3.17	
Categories (B)	4	33.27	59.74***
A x B	4	4.32	7.77***
B x C	4	0.59	n.s.
A x B x C	4	0.78	n.s.
Error $_{within}$	208	0.56	

*p$\leq$.10
***p$<$.001

Note.-N= 56

TABLE 6

Analysis of Variance:

Emotional Ratings Data

Source	df	MS	F
Sex (A)	1	5.26	n.s
Score (C)	1	4.69	n.s
A x C	1	0.09	n.s.
Error	17	2.97	
Categories (B)	4	10.94	18.36***
A x B	4	2.36	3.97**
B x C	4	0.35	n.s.
A x B x C	4	0.20	n.s.
Error	68	0.60	

**$p < .01$
***$p < .001$

Note.-N = 21

Figure 5. Graphic representation of the mean ratings across all groups and stimulus categories.

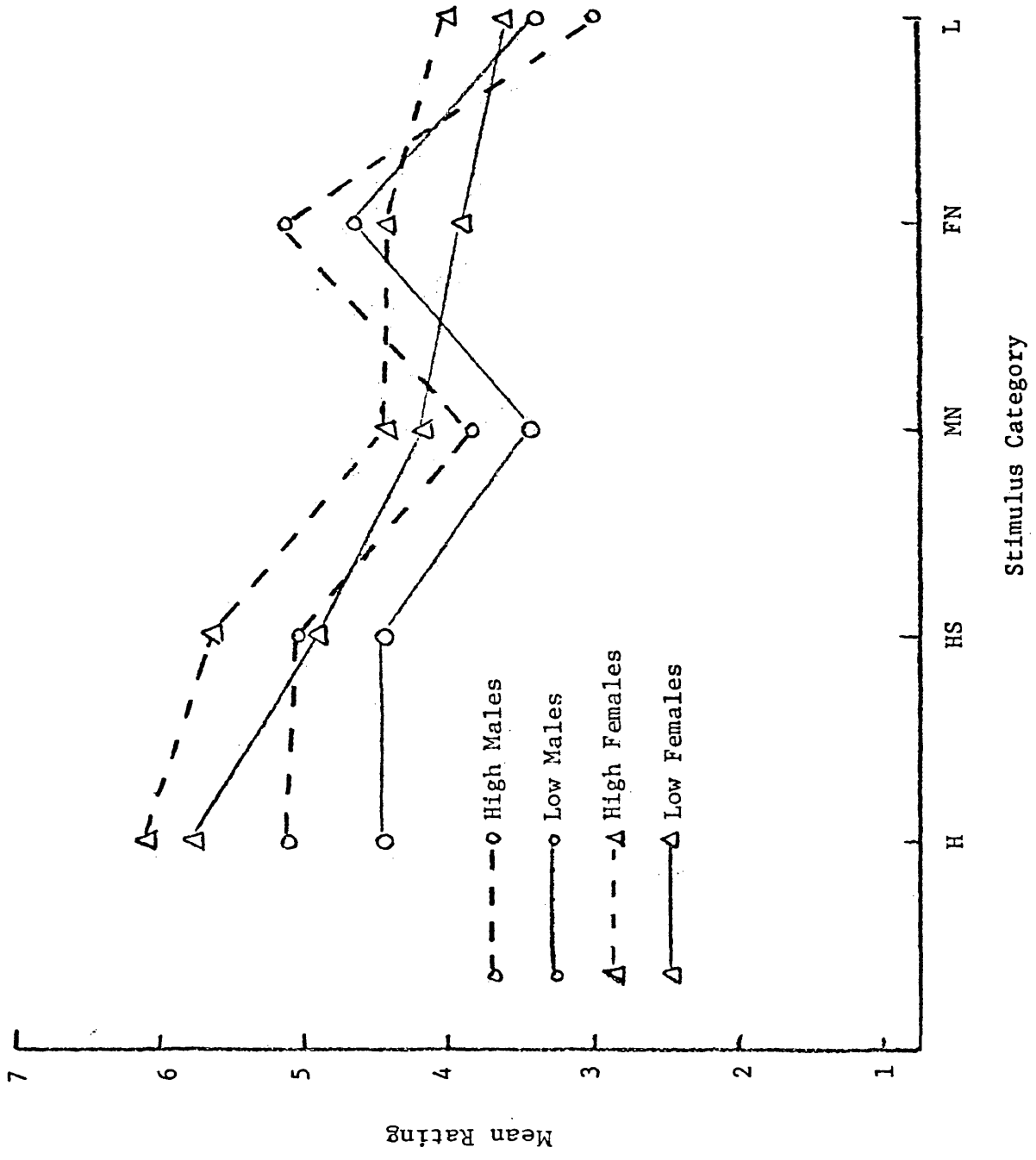

Mean Rating
7
6
5
4
3
2
1
H
HS
MN
FN
L
Stimulus Category
High Males
Low Males
High Females
Low Females

TABLE 7

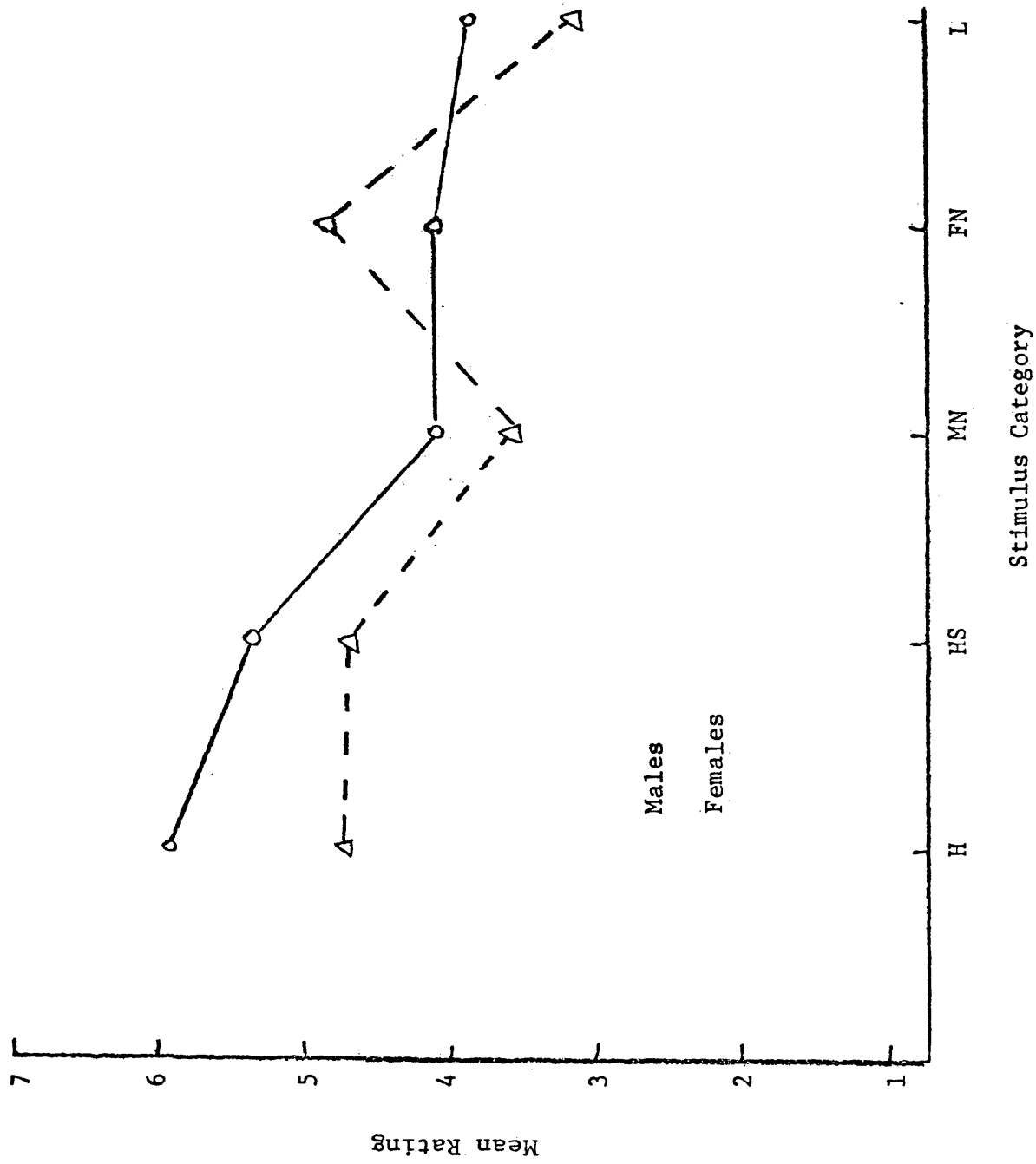
Tukey's Honest Significant Differance Multiple

Comparisons: (Sex x Category Interaction)

Viewer	Category	Viewer Category Means	M L 3.2	M MN 3.6	F L 3.8	F FN 4.1	F MN 4.1	M HS 4.7	M H 4.7	M FN 4.9	F HS 5.4	F H 5.9
Male	L	3.2	-	0.4a	0.6a	0.9	0.9	1.5	1.5	1.7	2.2	2.7
Male	MN	3.6		-	0.2a	0.5a	0.5a	1.1	1.1	1.3	1.8	2.3
Female	L	3.8			-	0.3a	0.3a	0.9	0.9	1.1	1.6	2.1
Female	FN	4.1				-	0.0a	0.6a	0.6a	0.8	1.3	1.8
Female	MN	4.1					-	0.6a	0.6a	0.8	1.3	1.8
Male	HS	4.7						-	0.0a	0.2a	0.7a	1.2
Male	H	4.7							-	0.2a	0.7a	1.2
Male	FN	4.9								-	0.5a	1.0
Female	HS	5.4									-	0.5a
Female	H	5.9										-

[a]Nonsignificant differences, $p < .05$

Figure 6. Mean emotional ratings for males and females across all stimulus categories.


Mean Rating
7
6
5
4
3
2
1
H
HS
MN
FN
L
Stimulus Category
Males
Females

Physiological data were scored and transformed as described in study 1 except that heart rate was not analyzed by minimum and maximum beats but by HR-V and HRA. HRA was computed by subtracting the prestimulus average heart rate from the stimulus interval rate. This yielded a measure of overall change from before the slide was visible to when it was in view. HR-V as described in Experiment 1 is a measure of HR variability and is computed by subtracting the slowest beat during the interval from the fastest beat (HRMAX-HRMIN). The only significant difference for any physiological measure ($F = 9.05$, $df = 1/17$, $p < .01$) was between groups in HR-V with Ss scoring low on the SDQ showing greater variability than high scorers. Means for the physiological measures are presented in Table 8.

A fidget index was computed by the same method described in study 1. There were no differences between groups or sexes but a significant difference ($F = 10.07$, $df = 1/14$, $p < .01$) between prestimulus and stimulus intervals with more fidgeting while the slide was visible.

Discrepancy scores were calculated by the method defined in study 1 and overraters (those showing greater subjective response than physiological response), and underraters (those exhibiting greater physiological than subjective response) were selected by the method described previously. Of the eight subjects defined as overraters, seven scored high on the SDQ and one scored low. Of the four subjects defined as underraters, two scored high on the SDQ and two scored low. An X^2 on these results shows that there is a nonsignificant

TABLE 8

Means For Physiological Response Modalities

Response Modality	Group	Stimulus Category				
		H	HS	MN	FN	L
HR-A	High Male	-0.17	-1.38	-1.71	-0.67	-1.58
	Low Male	-.281	0.18	-.38	-1.19	-2.13
	High Female	-1.25	0.00	0.45	-1.15	0.65
	Low Female	0.54	-1.58	-1.33	-0.54	0.75
HR-D	High Male	10.42	9.29	10.00	9.16	8.96
	Low Male	15.63	13.75	16.56	16.88	14.68
	High Female	9.75	9.50	11.50	9.75	10.00
	Low Female	15.00	13.12	12.50	16.04	15.00

TABLE 8 Continued

Response Modality	Group	Stimulus Category				
		H	HS	MN	FN	L
FPV	High Male	11.25	16.67	15.88	13.13	9.50
	Low Male	14.13	18.25	15.88	11.63	9.81
	High Female	8.40	7.55	5.15	5.65	5.30
	Low Female	10.75	9.83	10.42	9.92	10.67
GSR	High Male	0.023	0.029	0.029	0.030	0.023
	Low Male	0.023	0.037	0.027	0.037	0.019
	High Female	0.020	0.011	0.017	0.011	0.008
	Low Female	0.032	0.025	0.021	0.013	0.021

Note.-H is homicide victims, HS is heterosexual activity, MN is male nudes, FN is female nudes, and L is landscapes.

Note.-High and low refer to scores on the Self Description Questionnaire.

(X^2 = 2.0, df = 1, p < .10) relationship between the scores on the test and experimental definition of over- and underraters, although there may be a trend evident. Because of this nonsignificant difference and the small S sample size, further analysis of over- and underraters was not undertaken.

A comparison of the means and standard deviations for study 1 and 2 is presented in Table 9. The overall results of the two studies indicate significant differences in rating patterns (F = 9.84, df = 1/34, p < .01) with subjects in study 2 rating their emotional response higher than Ss in study 1. As expected there were also significant category differences (F = 43.99, df = 4/136, p < .001). These differences are presented graphically in Figure 7. The shock category in study was not included in the analysis as shock was not administered in study 2. Also, the third and fourth categories cannot be compared too strictly as they are different across studies. Category 3 was erotic art and bestiality (EA-B) in study 1 and male nudes in study 2. Category 4 was nudes (male and female) in study 1 and only female nudes in study 2. All other categories were the same. It is interesting that Ss in study 1 consistently rated their emotional responses lower than Ss in study 2. The only physiological measure that shows a difference in the two studies is HR-V. Study 2 subjects reacted with significantly (F = 7.83, df = 1/34, p < .01) more variability of heart rate response (HR-V) than did Ss in study 1.

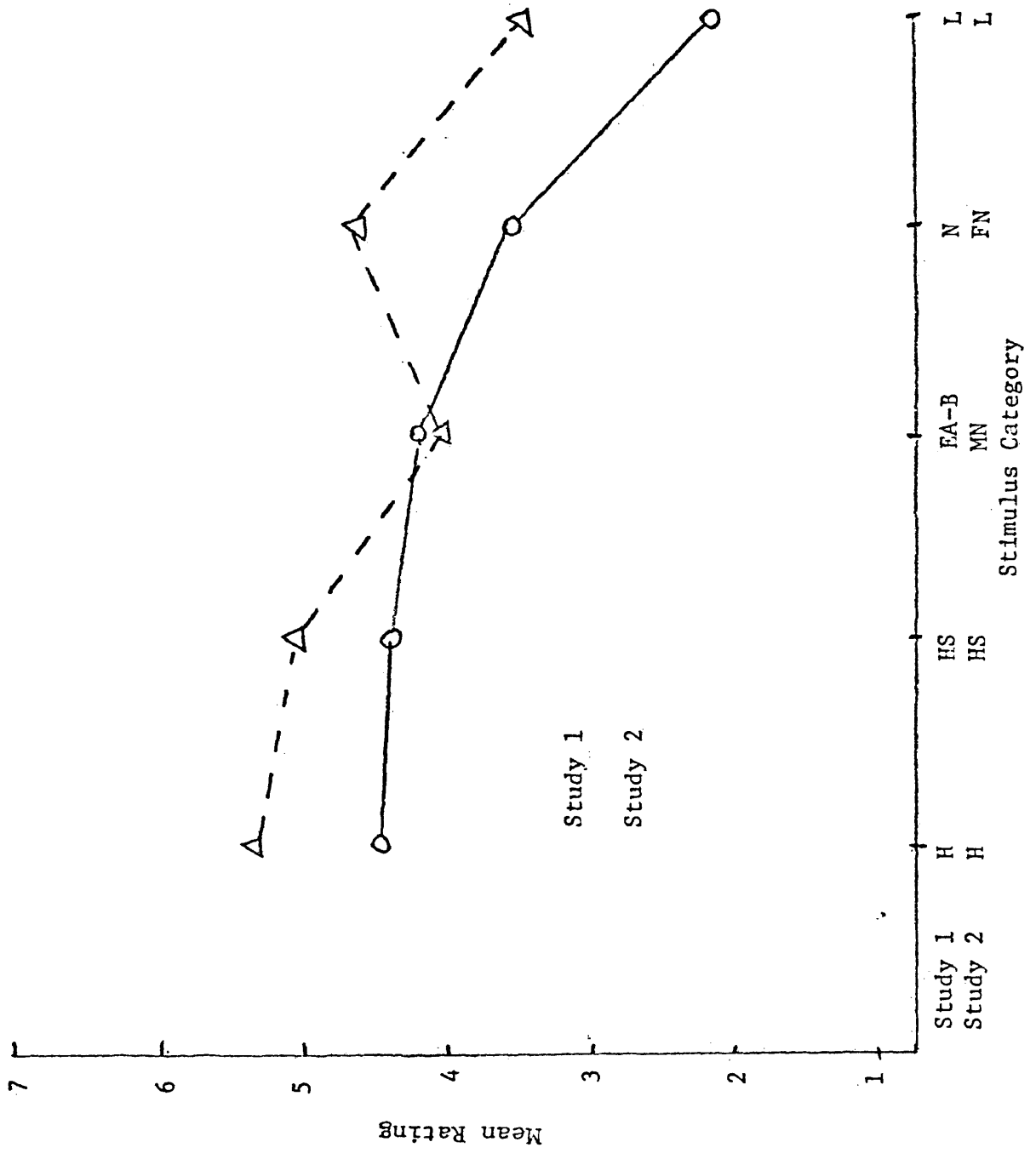
Two item analyses were performed on the items from the SDQ. The first analysis revealed which items significantly differentiated

TABLE 9

Comparison of Means and Standard Deviations of Study 1 and 2 for all Subjective and Physiological Measures

Dependent Measure	Experiment 1		Experiment 2	
	Mean	Standard Deviation	Mean	Standard Deviation
Ratings	3.93	1.54	4.47	1.52
HR-MIN	66.83	9.57		
HR-MAX	84.08	9.98		
HR-A			-0.78	3.79
HR-V	15.60	7.03	12.19	6.73
GSR	0.03	0.04	0.02	0.03
FPV	13.71	14.97	10.92	11.74

Figure 7. Comparison of mean ratings for all Ss in Experiments 1 and 2 across all categories.


Mean Rating
7
6
5
4
3
2
1
Study 1
Study 2
Study 1
Study 2
H
H
HS
HS
EA-B
MN
N
FN
L
L
Stimulus Category

high and low scorers on the SDQ. Since the SDQ predicted the emotional ratings of the homicide category better than it predicted ratings of the other categories, the second analysis compared each item by subjects who rated the homicide category as highly emotionally arousing versus subjects who rated the category as not so arousing. As can be seen in Figure 8, there is a bimodal frequency distribution of ratings of this category. Subjects were considered to be rating high if they rated six or above (N = 21) and low if they rated 4.75 or below (N = 24). Tables 10, 11, and 12 present the items that compose the A, B, and C subscales, respectively. The answer that an overrater would give is indicated in parenthesis. Items that significantly differentiated high and low scorers on the SDQ and high and low raters of homicide slides are also indicated.

Inspection of the tables shows that 12 out of 21 items from subscale A, four out of 17 items from subscale B, and four out of eight items from subscale C discriminate high from low scorers on the SDQ. It is also evident from these tables that eight out of 21 items from subscale A, two out of 17 items from subscale B, and one out of eight items from subscale C discriminate between high and low raters of emotional reactivity to homicide slides. In addition to these items, six fillers discriminate high from low scorers and four fillers discriminate high and low raters.

Figure 8. Frequency distribution of ratings of homicide slides only, used to select high and low raters for the item analysis.

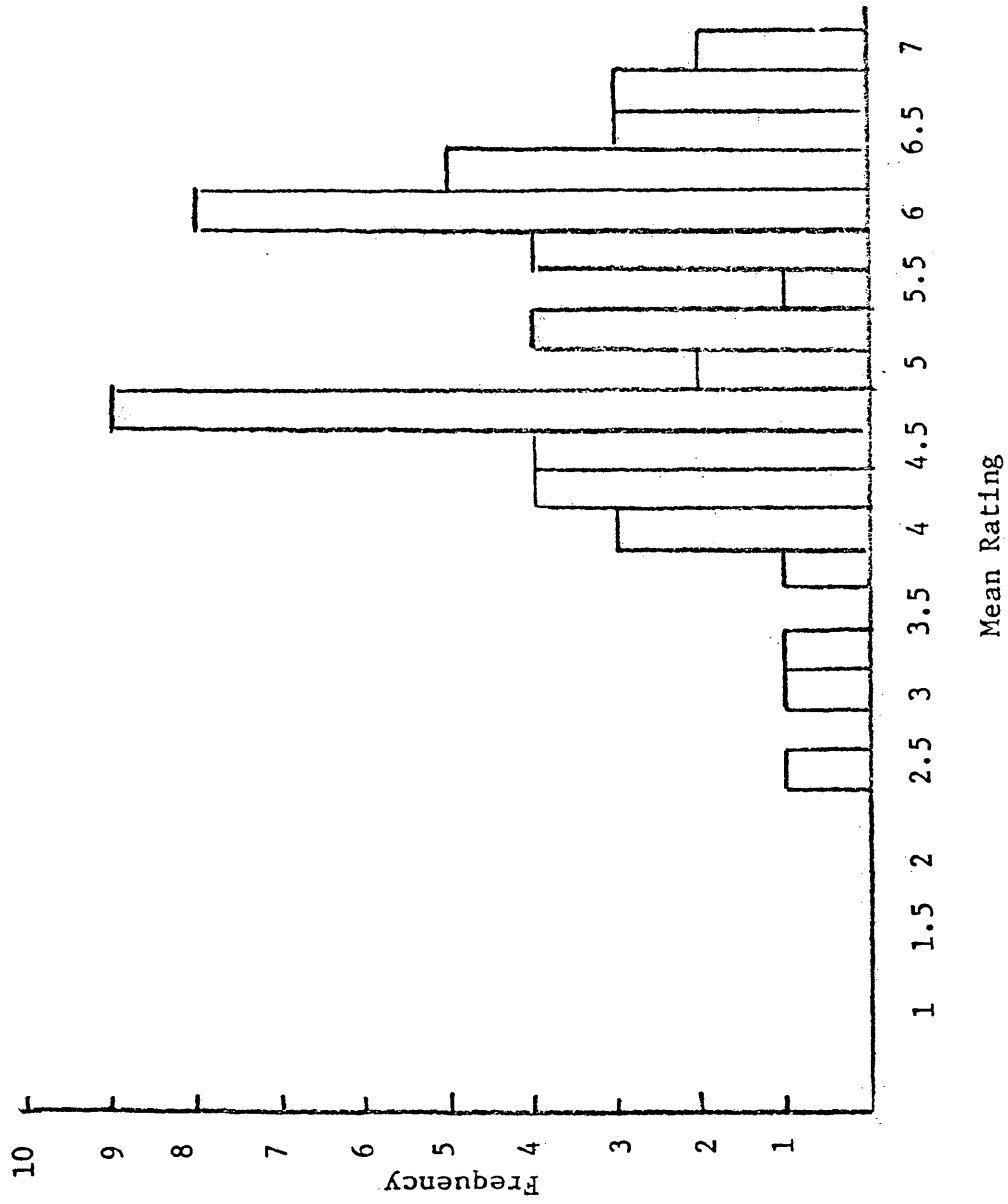

Frequency
10
9
8
7
6
5
4
3
2
1
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
6
6.5
7
Mean Rating

Table 10

Questions from the Self Description Questionnaire That Discriminated between Over- and Underraters in Experiment 1 (Subscale A)

Question number	Responses
[a],[b]4	I like mixing with people. (True)
[b]12	I don't seem to care what happens to me. (False)
[a],[b]20	At times I feel like picking a fist fight with someone. (False)
[a]23	I often feel "fed up." (False)
[b]24	Most nights I go to sleep without thoughts or ideas bothering me. (True)
26	I think people should concern themselves more with feelings than with ideas. (True)
[b]30	I suffer from "nerves." (True)
32	I have periods of such great restlessness that I cannot sit long in a chair. (True)
[a]34	I dream frequently about things that are best kept to myself. (False)
45	My plans have frequently seemed so full of difficulties that I have had to give them up. (True)
[a]46	I have several times had a change of heart about my life work. (False)

Table 10 (continued)

Question number	Responses
49	My judgment is better than it ever was. (False)
[a,b]50	I prefer to pass by school friends or people I know but have not seen for a long time, unless they speak to me first. (True)
[a]55	If a neighbor cheats me over small things, I would rather humor him than show him up. (True)
56	I think most witnesses tell the truth even if it becomes embarrassing. (True)
[a,b]58	I can look anyone in the eye and tell a lie with a straight face (if for a right end). (False)
[a]59	I admire more: (a) a clever but undependable man, (b) an average man but strong to resist temptations. (b)
[a]66	I usually say nothing if the tools given me to do a job are not quite what they should be. (True)
[a]68	I suspect that people who act friendly to me can be disloyal behind my back. (Rarely)

Table 10 (continued)

Question number	Responses
[a]70	I may deceive people by being friendly when I really dislike them. (False)

Note.--The response that an overrater would give is indicated in parenthesis.

[a]Question that discriminated high from low scores on the Self Description Questionnaire in Experiment 2.

[b]Question that discriminated high from low raters of homicide slides.

Table 11

Questions from the Self Description Questionnaire That the Experimenters Created (Subscale B)

Question number	Responses
3	I would like to try acting in community theatre. (True)
6	I have always preferred to have a very few close friends rather than a large circle of friends. (False)
[a]9	I sometimes brood a lot. (False)
10	All in all I think that I am able to think more critically than most people. (False)
14	I enjoy mysteries and scary movies. (True)
15	I tend to control my tender emotions around people. (False)
[a]16	I try to please people. (True)
[a]21	I sometimes take a cynical view of things. (False)
22	It is best not to always show your feelings. (False)
27	I remember most of my dreams. (True)
28	Sometimes I feel angry and resentful about the way I've been treated. (False)
[a,b]31	There aren't very many people whom you can trust. (False)
33	I enjoy light, humorous conversations more than serious intellectual ones. (True)
36	As a child I experienced times when I preferred playing alone, to playing with other children. (True)

Table 11 (continued)

Question number	Responses
41	I feel angry a lot. (False)
43	I am an emotionally expressive person. (True)
48	I enjoy musicals more than Greek tragedies. (True)

Note.--The expected response of an overrater is indicated in parenthesis at the end of the question.

[a]Question that discriminated high and low scores on the Self Description Questionnaire.

[b]Question that discriminated high from low raters of homicide slides.

Table 12

Questions from the Self Description Questionnaire That Were Originally from the Autonomic Perception Questionnaire and Discriminate Over- from Underraters (Subscale C)

Question number	Responses
5	When you feel anxious, do you perspire? (Yes)
[a]6	When you feel anxious, does your mouth become dry? (Yes)
[a]8	When you feel anxious, do you get a headache? (Yes)
9	When you feel anxious, how often are you aware of any change in your heart action? (Rarely)
[a,b]10	When you feel anxious, do you experience accelerated heart beat? (No)
[a]11	When you feel anxious, does the intensity of your heart beat increase? (No)
20	When you feel anxious, do you have any difficulty talking? (Yes)

Table 12 (continued)

Question number	Responses
21	When you feel anxious, are you bothered by your bodily reactions? (Yes)

Note.--The response that an overrater would give is indicated in parenthesis at the end of each statement.

[a]Question that discriminated high from low scores on the Self Description Questionnaire.

[b]Question that discriminated high from low raters of homicide slides.

Discussion

The SDQ failed to predict over- or underraters in the procedure utilized in Experiment 2. Emotional ratings for homicide slides were predicted by the SDQ better than other categories. One explanation for the lack of validation may be the low test-retest reliability of the SDQ, but these low correlations may be an artifact of the limitations of the measurement procedures. According to Crano and Brewer (1973)

> The size of the correlation between any two variables will be automatically attenuated (i.e., lessened) if the range of scores on either or both measures is restricted. This attenuation may be the result of a limitation of the opportunity for systematic relations to appear . . . .

As the test-retest reliability scores were computed only with subjects scoring extremely high or low on the first administration, the entire middle range was eliminated, thus greatly restricting the range. Correlations computed separately for high and low scorers on the SDQ yielded reliability scores that were even lower than those which used all subjects, thus lending further support for Crano and Brewer's attenuation notion. On the basis of this evidence, it seems reasonable to assume that the reliability scores computed are underestimations of the actual reliability.

Another explanation for the lack of predictability of the SDQ is the nature of the Chi Square Statistic used to select items. This statistic tests the assumption that both samples are representative

of a common population. Thus a significant difference may appear if one group consistently responds "true" (or "false") but the other group is equally likely to answer "true" or "false." For instance, item 50 significantly ($p < .05$) differentiated high from low scorers on the SDQ. Low scorers tended to answer positively but high scorers were just as apt to answer positively as negatively. This distinction is easily camouflaged when scoring items; in this case a positive answer should describe a low scorer, but about half of the time a high scorer will also reply positively. This weakness in the procedure could be corrected by scoring each item unidirectionally and separately for over- and underraters (i.e., a negative reply in this example would indicate an overrating tendency and as such would add to the Ss overrating score. A positive answer, however, would be ambiguous and would not add to his underrating score.). Further research with the SDQ would require a scoring procedure of this type.

The writer feels that the lack of predictability from the SDQ to Experiment 2 may be a function of the differences between study 1 and study 2. The stress value of the stimuli used in study 1 seemed higher than for those used in study 2. This may be a result of the procedure for selecting stimuli in study 2. In study 1 each S viewed and rated each slide, then the E chose the most stressful slides from each category that the S would see again. Thus each S chose his own slides and saw again the ones he considered most emotionally arousing. Subjects in study 2 did not have the advantage of briefly seeing the slide pool and refusing to see some slides;

therefore, when the E selected them, she chose the most innocuous slides that still seemed threatening. This difference in stressfulness of slides is contradicted in Table 9 which shows that Ss in study 2 rated the slides more emotionally arousing. It should also be noted that the mean rating for Ss in study 1 is that of their second view of the slides. They had already seen the slides once and knew what to expect. They also knew that any slides they really objected to would not be shown again. Thus, study 1 Ss were better informed and could relax more and overall rate less emotional response than study 2 Ss. Also, the instructions for study 2 mentioned the fact that although some of the slides would be unpleasant and arouse negative emotions, some of the slides might be pleasant or exciting and arouse positive emotion. The idea of pleasant slides which might arouse positive emotion was not emphasized in study 1. Another difference was the fact that individual differences in reaction to particular slides were taken into account through the individualized slide selection procedure utilized in study 1, something that could not be done in Experiment 2.

Further support for the notion of differentially stressful stimuli between studies comes from analysis of the physiological data. Although the overall levels of response are the same, in the first study the categories were discriminated by almost all physiological response modalities. This discrimination between categories is lacking in the second study. Ss were not reacting any differently physiologically to the landscape slides than to the stressful slides.

This lack of discrimination suggests that

a. there was no difference in arousal quality between the neutral landscapes and the supposedly stressful categories (i.e., the stimuli that were labeled stressful were not actually stressful), or

b. a different response to varying stimuli was masked by general physiological response caused by just being in the experimental situation.

Both of these explanations are messy. If "a" were correct then should the subjective ratings also not discriminate categories? Ss did discriminate categories subjectively, but perhaps this is a function of social desirability or experimental demands. The subject knows that most people would react more strongly to a homicide victim than to a tulip garden even if he is not reacting more strongly at the moment. If "b" were correct then why were responses from Ss in study 1 not also masked? As stated before, Ss from the first experiment had been in the room longer, they had seen all of the slides before, they knew what to expect; therefore, they could attend to the stimulus itself rather than giving a general response to the overall situation. However, a concerted effort was made to control this problem in study 2 by tailoring the time needs to the subject from whom physiological data was recorded; the length of the adaption period was determined by when his responses stabilized and the next slide was not presented until his physiological responses had returned to near baseline. Thus, neither explanation can be ruled out or completely endorsed.

A cognitive physiological theory of emotion would predict that if it were true that the stress value of the stimulus categories did not vary appreciably across categories then the physiological response should not vary across categories either, as is evident in the data. Also postulating from a cognitive physiological theory of emotion, if there was little stress, producing little response then there would be little need for cognitive reappraisal of the stimulus by the S's characteristic coping style. This low arousal would act as a "floor" for physiological reactions making it difficult for Ss to underrate their reaction to the slides (since it was so low anyway) and might also explain why so few underraters were observed in study 2 as compared to study 1.

Another factor reducing the ability of the SDQ to predict cognitive appraisal patterns may be that it is related only to patterns of appraisal of stressful stimuli and the experimental stimuli consisted of both stressful and neutral stimuli. The fact that the SDQ did predict ratings of homicide slides better than other stimuli gives support to this notion. Perhaps the investigators expected too much of the scale and only stimuli that were definitely stressful should have been used.

Another difference between study 1 and 2 is related to objectiveness of the experimental situation and the demand characteristics that were established. Study 2 was more formal and objective: Taped instructions, subject contact established by an uninvolved E, written responses, presence of other subjects, the

increased amount of equipment, separation of subjects from equipment, and separation of the Es all contributed to the increased objectivity. Because the situation was perceived as more objective, subjects might have been more inhibited about giving extreme scores, they might have felt that they were expected to give a "true" response rather than one that reflected their normal defensive style.

Closer inspection of the results of the item analyses reveals some interesting insights concerning the characteristics of high and low scorers and raters. Both overraters from Experiment 1 and high scorers on the SDQ answer "yes" or "true" to items that seem to reflect a social desirability factor (questions 4, 17, 38, 55, 66). These subjects like to mix with people, try to please, would rather not show up people, would not make a fuss at not having the right tools and would not vote for a candidate about whom they knew very little. In addition to answering in a socially desirable fashion high raters of the homicide slides seemed to express a tendency to "worry" or be nervous. They claimed to have more trouble sleeping (question 24), to suffer from nerves (question 30), to sweat easily (question 37) and to be emotionally expressive (question 43). Furthermore, both high scorers and high raters replied that they were aware of autonomic activity (as indicated by the APQ) for all items that discriminated between groups except items that involved a heart rate response. High scorers were less aware of a heart rate response than low scorers. It is interesting that the only physiological measure that discriminated high and low scorers was the heart

rate variability (HR-V) measure, indicating that low scorers not only perceived more heart rate response on the APQ but actually responded more than did high scorers in that modality. Thus it seems that high scorers on the SDQ and high raters of emotional response to homicide slides may be described by two factors--social desirability and a tendency to worry.

There is some evidence to indicate that the proclivity to underrate or deny emotional reaction parallels processes involved in the paranoid symptoms (Shean & Schmaltz, 1973). Carson (1960) and Spielberger (1957) describe the paranoid person as suspicious, brooding, rigid, hostile and sometimes obsessive. A paranoid also tends to be slightly repressive--to deny emotional response, to have unacceptable thoughts and to project hostility to others. Although the writer does not mean to imply that low scoring on the SDQ is indicative of paranoid tendencies, scrutiny of questions answered "yes" or "true" by low scorers and low raters reveals some striking similarities. Questions answered affirmatively by underraters from Experiment 1 and low scorers in Experiment 2 may be divided into two clusters. The first cluster could be labeled as expressing anger, hostility and suspiciousness. This cluster includes questions 20, 21, 23, 50, 59, 60, 65, 68, 70, which deal with anger, distrust, annoyances, disloyalty or deception. Three other questions (7, 9, 46) suggest that low scorers and underraters also tend to brood or obsess considerably. The second cluster has to do with repression or denial of emotional responses (questions 24, 34, 35, 58). Low scorers and

raters have unacceptable thoughts, dreams best kept to themselves, lack of emotional expressiveness and the ability to hide their emotions well enough to lie with a straight face. This descriptive analysis of both clusters incorporates all items answered positively by low raters except question 38 which involves voting for a candidate about whom little is known, which may also be a cynical response.

Although the overall SDQ did not predict rating patterns in Experiment 2, the analysis of individual items indicated that high and low scorers seem to represent two distinct and unique personality types. Perhaps further research with a larger pool of items and more heterogenous subjects is needed to refine and validate the questionnaire. It would be especially interesting to investigate whether the cognitive style of coping with stress is completely dispositional or is also influenced by situational variables.

Appendix

Appendix

Self Description Questionnaire

Instructions

This is a very general personality questionnaire designed to tap some of the multidimensional characteristics of you and how you usually behave. The questionnaire is divided into three sections and separate instructions appear before each section. These questions concern the way you behave, feel and act. Try to decide which answer represents your usual way of acting or feeling. There are no right or wrong answers and this is not a test of intelligence or ability, but simply a measure of the way you behave. Although this is an untimed test, we would still like you to answer the questions as quickly as you can. Do not spend time puzzling over the questions. Give the first, natural answer as it comes to you. Some questions are a bit similar to others but no two are exactly alike and your answers will often differ in these cases. Answer the questions as frankly and truthfully as possible since there is no advantage in giving the wrong impression. Never give an untrue answer about yourself because you think it is the "right thing to say". Do not skip any questions. Occasionally a statement may not seem to apply to you or your interests, but answer every one somehow. Your answers will be kept confidential and used only for research purposes.

Use the answer sheet provided for sections one and two, and answer directly beneath the questions in section three.

Section One Instructions

This section consists of true and false questions. Read each statement and decide whether it is true as applied to you or false as applied to you. If a statement is TRUE OR MOSTLY TRUE, as applied to you, cross out the "T" on the answer sheet next to the statement number. If a statement is FALSE OR NOT USUALLY TRUE, as applied to you, cross out the "F" on the answer sheet next to the statement number. DO NOT write on the test itself (only the answer sheet) for this section.

1. I am easily awakened by noise.

2. I sometimes feel happy, sometimes sad without any real reason.

3. I would like to try acting in community theatre.

4. I like mixing with people.

5. I find it hard to keep my mind on a task or job.

6. I have always preferred to have a very few close friends rather than a large circle of friends.

7. I often think of my past.

8. I usually feel that life is worthwhile.

9. I sometimes brood a lot.

10. All in all I think that I am able to think more critically than most people.

11. My hardest battles are with myself.

12. I don't seem to care what happens to me.

13. I am moody.

14. I enjoy mysteries and scary movies.

15. I tend to control my tender emotions around people.

16. I find it hard to fall asleep at bedtime.

17. I try to please people.

18. At times my thoughts have raced ahead faster than I could speak them.

19. I am often lost in thought.

20. At times I feel like picking a fist fight with someone.

21. I sometimes take a cynical view of things.

22. It is best not to always show your feelings.

23. I often feel "fed-up."

24. Most nights I go to sleep without thoughts or ideas bothering me.

25. I wish I were not so shy.

26. I think people should concern themselves more with feelings than with ideas.

27. I remember most of my dreams.

28. Sometimes I feel angry and resentful about the way I've been treated.

29. What others think of me does not bother me.

30. I suffer from "nerves."

31. There aren't very many people that you can trust.

32. I have periods of such great restlessness that I cannot sit long in a chair.

33. I enjoy light, humorous conversations more than serious intellectual ones.

34. I dream frequently about things that are best kept to myself.

35. I believe I am no more nervous than most others.

36. As a child I experienced times when I preferred playing alone, to playing with other children.

37. I sweat very easily even on cool days.

38. Sometimes at elections I vote for men about whom I know very little.

[Question 39 omitted from original questionnaire.]

40. I have been afraid of things or people that I knew could not hurt me.

41. I feel angry a lot.

42. I often think, "I wish I were a child again."

43. I am an emotionally expressive person.

44. I have dizzy spells.

45. My plans have frequently seemed so full of difficulties that I have had to give them up.

46. I have several times had a change of heart about my life work.

47. I have a daydream life about which I do not tell other people.

48. I enjoy musicals more than Greek tragedies.

49. My judgment is better than it ever was.

50. I prefer to pass by school friends, or people I know but have not seen for a long time, unless they speak to me first.

Section Two Instructions

These questions may be answered in the format "Yes," "Sometimes," or "No." The questions are to give you a chance to say what sort of a person you are and to state your interests and attitudes. Since each person is different, there are generally no "right" or "wrong" answers, but only what is true for you.

Be sure and answer all questions on the answer sheet provided. To the right of each question are three possible answers. Use the middle answer only when it is absolutely impossible to lean toward one or the other of the answer choices. In other words, the "Yes" (or "a") or the "No" (or "b") answer should be used for most cases. Cross out the correct answer on the answer sheet. Be sure that the statement number agrees with the number on the answer sheet. DO NOT write on the test itself (only the answer sheet) for this section.

51. I could happily live alone, far from anyone, like a hermit. . . . . Yes Occasionally No

52. When I am going to catch a train, I get a little hurried, tense, or anxious, though I know I have time . . . . . Yes Sometimes No

53. I always have lots of energy at times when I need it . . . . . Yes In Between No

54. In streets or stores I dislike the way some people stare at one . . . . . Yes In Between No

55. If a neighbor cheats me over small things, I would rather humor him than show him up . . . . . Yes Occasionally No

56. I think most witnesses tell the truth even if it becomes embarrassing . . . . . Yes In Between No

57. I am a sound sleeper, never walking or talking in my sleep. . . . . Yes In Between No

58. I can look anyone in the eye and tell a lie with a straight face (if for a right end) . . . . . Yes Occasionally No

59. I admire more:

a) a clever but undependable man,

b) an average man but strong to resist temptations . . . . . a In Between b

60. I get annoyed at being held up by small rules and regulations which, I admit are

really necessary . . . . . Yes In Between No

61. I think the proper number to continue the series 1,2,3,6,5, is: a) 10, b) 5, c) 7 . . a b c

62. I would rather do without something than put a waiter or waitress to a lot of extra trouble . . . . . Yes Occasionally No

63. My memory does not change much from day to day . . . . . Yes Sometimes No

(true) (false)

64. I think that what people say in poetry could be put just as exactly in plain prose . . . . . Yes Sometimes No

65. Prim, strict people do not seem to get on well with me . . . . . Yes Sometimes No

(true) (false)

66. I usually say nothing if the tools given me to do a job are not quite what they should be . . . . . Yes Sometimes No

(true) (false)

67. I am more restrained than most people in saying what my feelings are . . . . . Yes Sometimes No

68. I suspect that people who act friendly to me can be disloyal behind my back: a) yes, generally, b) occasionally, c) no, rarely a b c

69. I tend to speak rather slowly . . . Yes Sometimes No

70. I may deceive people by being friendly when I really dislike them . . . . . Yes Sometimes No

Section Three Instructions

This section is designed to give you an opportunity to describe your subjective experience in relation to several dimensions of emotion. One of the main reasons for this section is that very little is known about the subjective experiences that accompany various feeling states. We assume that people differ in the way in which they experience various emotions. What we are particularly interested in is how widely people differ in describing these experiences and in the specific perceptions associated with them.

The value of this questionnaire will in large part depend on how frank you are in stating your feelings, attitudes, and experiences. Needless to say, your answers will be kept strictly confidential and used only for research purposes. There are no catch questions in this section. Please read each question in each scale very carefully and consider your answer.

First we are interested in two general feeling states. The first state we are concerned with is "pleasure, happiness, a state of well-being." Please imagine "how" (not why) you feel when you are in this state. Especially consider the outstanding bodily reactions which you associate with this experience. In subsequent sections, when we refer to the subjective feeling of "happiness" we will expect you to refer back to this thought description.

The second state we are concerned with is "anxiety, apprehensiveness, tension." Please imagine "how" (not why) you feel when you are in this state. Especially consider the outstanding bodily

reactions which you associate with this experience. In subsequent sections, when we refer to the subjective feeling of "anxiety" we will expect you to refer back to this thought description.

[Please mark directly on the test for this section only.]

For each question there is a line or scale on the ends of which are statements of extreme feelings or attitudes. You are required to put a mark (X) on that point on the line which you think best indicates the state of your feeling or attitude about the particular question. When you find it difficult to mark a particular scale, use your best possible estimate of how you might feel.

Name_____

"Think about each question carefully before you answer. Remember, you may put the mark anywhere on the line."

1. When you feel anxious, are you aware of many bodily reactions?

Aware of very many — Aware of very few

2. When you feel anxious, how often are you aware of your bodily reactions?

Always — Never

3. When you feel anxious, does your face become hot?

Does not change — Becomes very hot

4. When you feel anxious, do your hands become cold?

No change — Very cold

5. When you feel anxious, do you perspire?

A great deal — Not at all

6. When you feel anxious, does your mouth become dry?

Always — Never

"Think about each question carefully before you answer. Remember, you may put the mark anywhere on the line."

7. When you feel anxious, are you aware of increased muscle tension?

No increased tension A great deal of tension

8. When you feel anxious, do you get a headache?

Always Never

9. When you feel anxious, how often are you aware of any change in your heart action?

Never Always

10. When you feel anxious, do you experience accelerated heart beat?

No change Great acceleration

11. When you feel anxious, does the intensity of your heart beat increase?

Does not change Increases to extreme pounding

12. When you feel anxious, how often are you aware of change in your breathing?

Always Never

"Think about each question carefully before you answer. Remember, you may put the mark anywhere on the line."

13. When you feel anxious, does your breathing become more rapid?

No change Very rapid

14. When you feel anxious, do you breathe more deeply?

Much more deeply No change

15. When you feel anxious, do you breathe more shallowly?

Much more shallowly No change

16. When you feel anxious, do you feel as if blood rushes to your head?

Always Never

17. When you feel anxious, do you get a lump in your throat or a choked-up feeling?

Always Never

18. When you feel anxious, does your stomach get upset?

Not at all Very upset

"Think about each question carefully before you answer. Remember, you may put the mark anywhere on the line."

19. When you feel anxious, do you get a sinking or heavy feeling in your stomach?

Never Always

20. When you feel anxious, do you have any difficulty talking?

Never Always

21. When you feel anxious, are you bothered by your bodily reactions?

Bothered very much Not bothered at all

22. When you feel happy, are you aware of many bodily reactions?

Aware of very many Aware of very few

23. When you feel happy, are you aware of any change in your heart action?

Always Never

"Think about each question carefully before you answer. Remember, you may put the mark anywhere on the line."

24. When you feel happy, do you experience accelerated heart beat?

No change Great acceleration

25. When you feel happy, does your face become hot?

Does not change Becomes very hot

26. When you feel happy, do you ever feel weak or shaky?

Always Never

27. When you feel happy, do you get a lump in your throat or a choked-up feeling?

Always Never

28. When you feel happy, do you have any difficulty talking?

Never Always

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